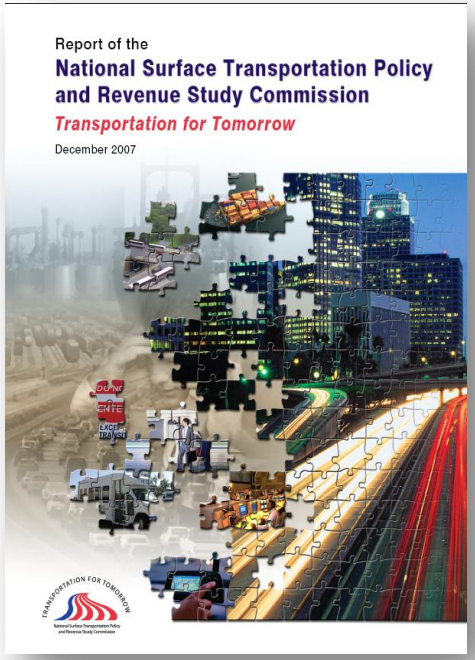
An Overview of TERM Lite

What is TERM?

- Transit **E**conomic **R**equirements **M**odel
  - FTA's Capital Needs Analysis Tool
  - National level analysis of:
    - State of Good Repair (SGR) backlog
    - Asset conditions
    - 20-year projection of reinvestment needs
    - Impact of variations in funding
  - Supports biennial Conditions and Performance (C&P) Report to Congress and related studies

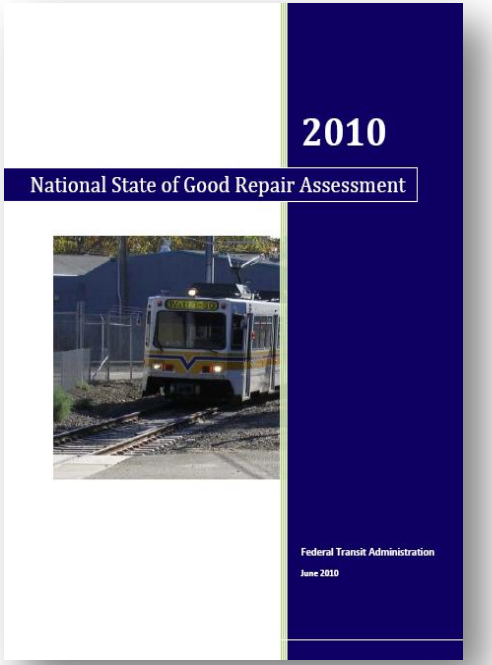
What is TERM? (continued) – Related reports

The ***National Surface Transportation Commission*** examined the condition and future needs of the nation's surface transportation system



The ***Rail Modernization Study*** assessed the investment backlog and capital reinvestment needs of the nine largest rail operators

The ***National State of Good Repair*** assessed the investment backlog and capital reinvestment needs of the transit industry



What is TERM "Lite"?

- Local Version of TERM
  - Designed for local long-term SGR needs analysis
  - Developed in Microsoft Access
  - Freely available through the FTA website

TERM vs. TERM Lite		
Capability	**TERM**	**TERM-Lite**
Level of Analysis	National	Local / Regional
Intended User Group	FTA	Local operators
Life Cycle Driver	Condition (estimated)	Age
Prioritization	Benefit-cost analysis	User-defined criteria
Output Format	Access Tables	Excel
Output (current and forecast)	▸ SGR backlog ▸ Asset conditions ▸ 20-yr reinvestment needs	

Why do I "Need" TERM Lite?

TERM Lite can answer these questions

TERM Lite Capabilities		
Function	**Question Addressed**	**Output**
SGR Monitoring	Where are we today?	▸ Current SGR backlog ▸ Asset conditions
SGR Management ("What if" Analysis)	Where can I be tomorrow?	▸ Is backlog increasing / decreasing? ▸ What is the level of investment to attain SGR in 10 years? 20 years?
Long-Term Capital Plan Support	How should I prioritize limited investment dollars?	▸ Multi-criteria prioritization rankings ▸ Long term SGR plan

TERM Lite is an additional tool (not a substitute) that can be used for traditional capital planning

How was TERM Lite Being Developed?

Cooperative Development

- Industry input

Chicago RTA

LA Metro

San Francisco MTC

Requirements Analysis

- What features do you need?
  - ✓ Ease of use
  - ✓ Local level asset definitions
  - ✓ Investment prioritization
  - ✓ Constructability constraints
  - ✓ Asset to project mappings

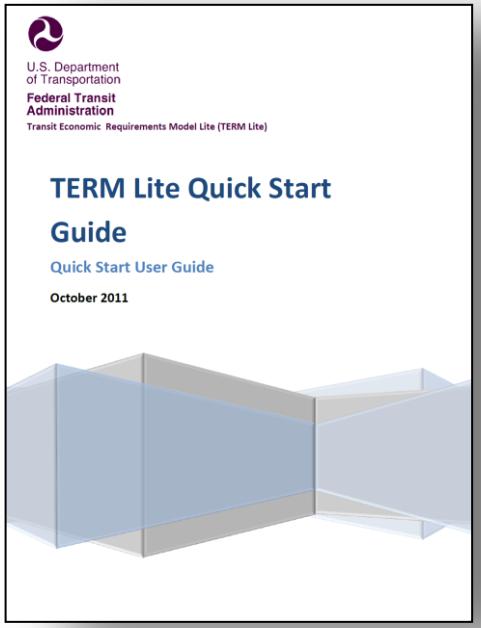
What do you need to run TERM Lite?

✓ Asset Inventory

Code	Category	Element	Type	Quantity
51601	Vehicles	Heavy Rail	HR	3
51903	Vehicles	Motor Bus	BA	3
51903	Vehicles	Motor Bus	BA	300
51903	Vehicles	Motor Bus	BA	480
51901	Vehicles	Motor Bus	AB	226
51903	Vehicles	Motor Bus	BA	1010
51905	Vehicles	Motor Bus	BC	45
51903	Vehicles	Motor Bus	BA	10
51903	Vehicles	Motor Bus	BA	10
51901	Vehicles	Motor Bus	AB	73
53001	Vehicles	Car	-	84
53001	Vehicles	Car	-	4
53002	Vehicles	Truck	-	1
53002	Vehicles	Truck	-	116
53002	Vehicles	Truck	-	31
53002	Vehicles	Truck	-	31
53002	Vehicles	Truck	-	4
53002	Vehicles	Truck	-	6
53002	Vehicles	Truck	-	1
53002	Vehicles	Truck	-	28

✓ Microsoft Access

✓ User's Guide



How Does TERM Lite Work?

What do I own & what condition is it in?

- Asset conditions and quantities
- Cost to replace

Asset Inventory

Investment Policy

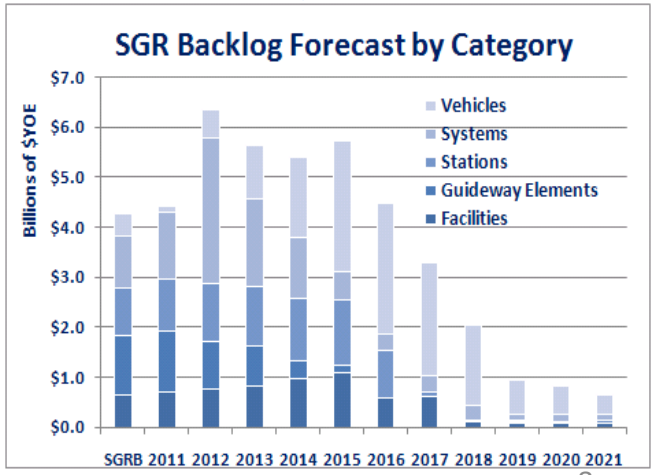
- When to rehab & replace
- Funding
- Priorities

What would I like to do, how much funding do I have, what are my priorities?

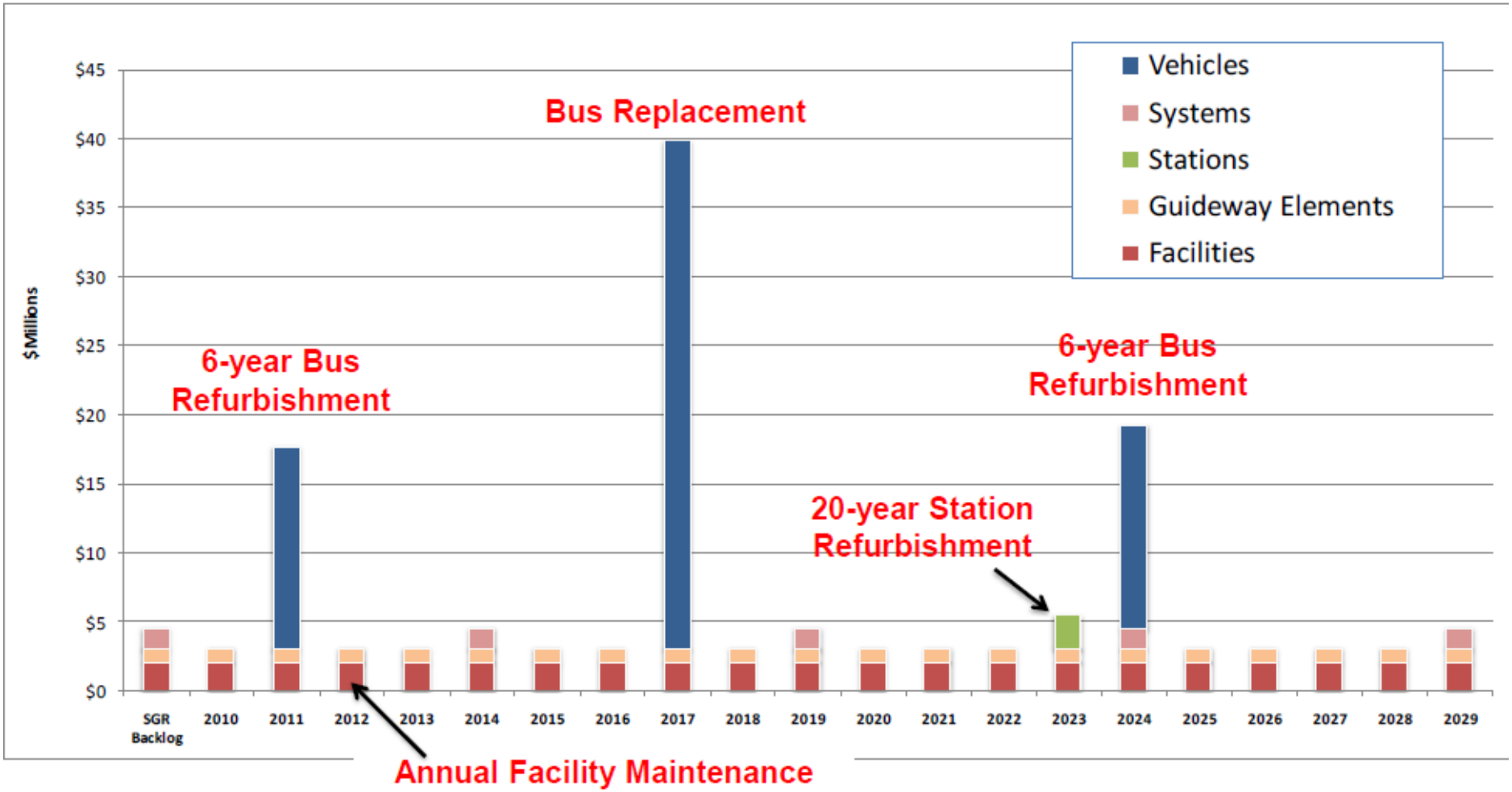
What are my potential backlog, condition and performance outcomes?

- SGR backlog
- Asset conditions
- Reinvestment needs
- Prioritized plan

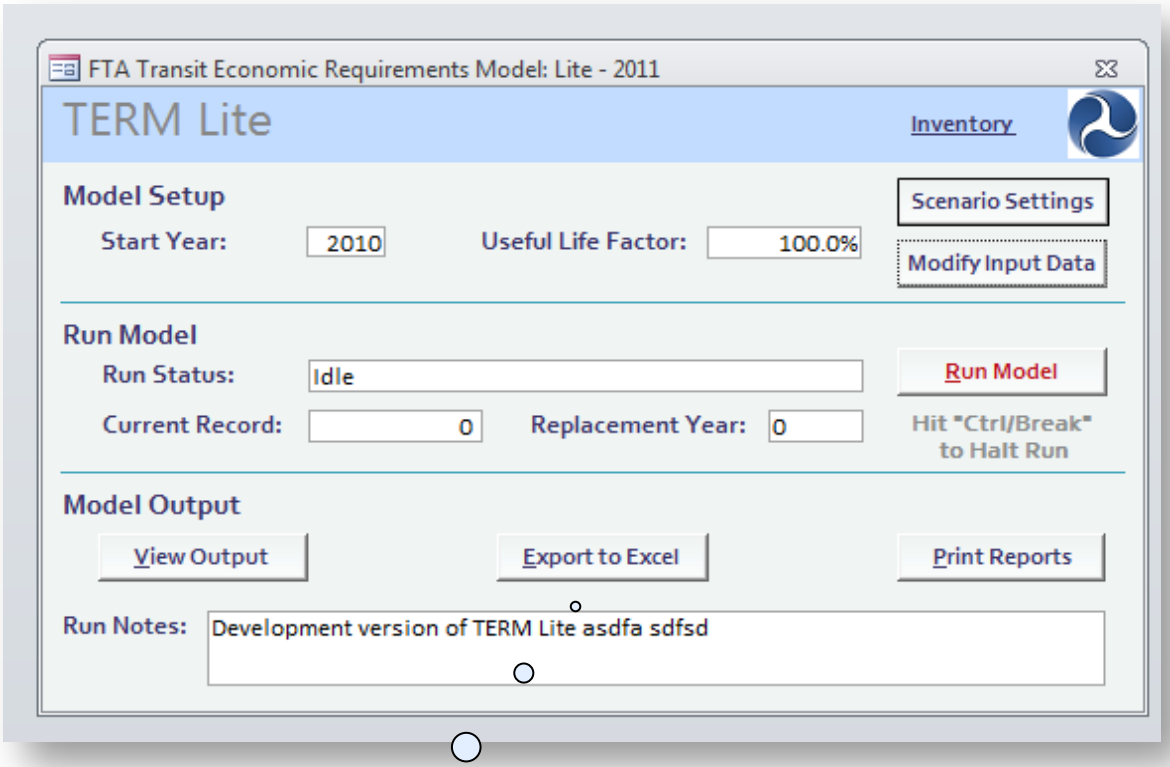
SGR Forecast



Analysis Example: New 100 Bus Agency Started in 2004



What does TERM Lite Look Like? - User Interface



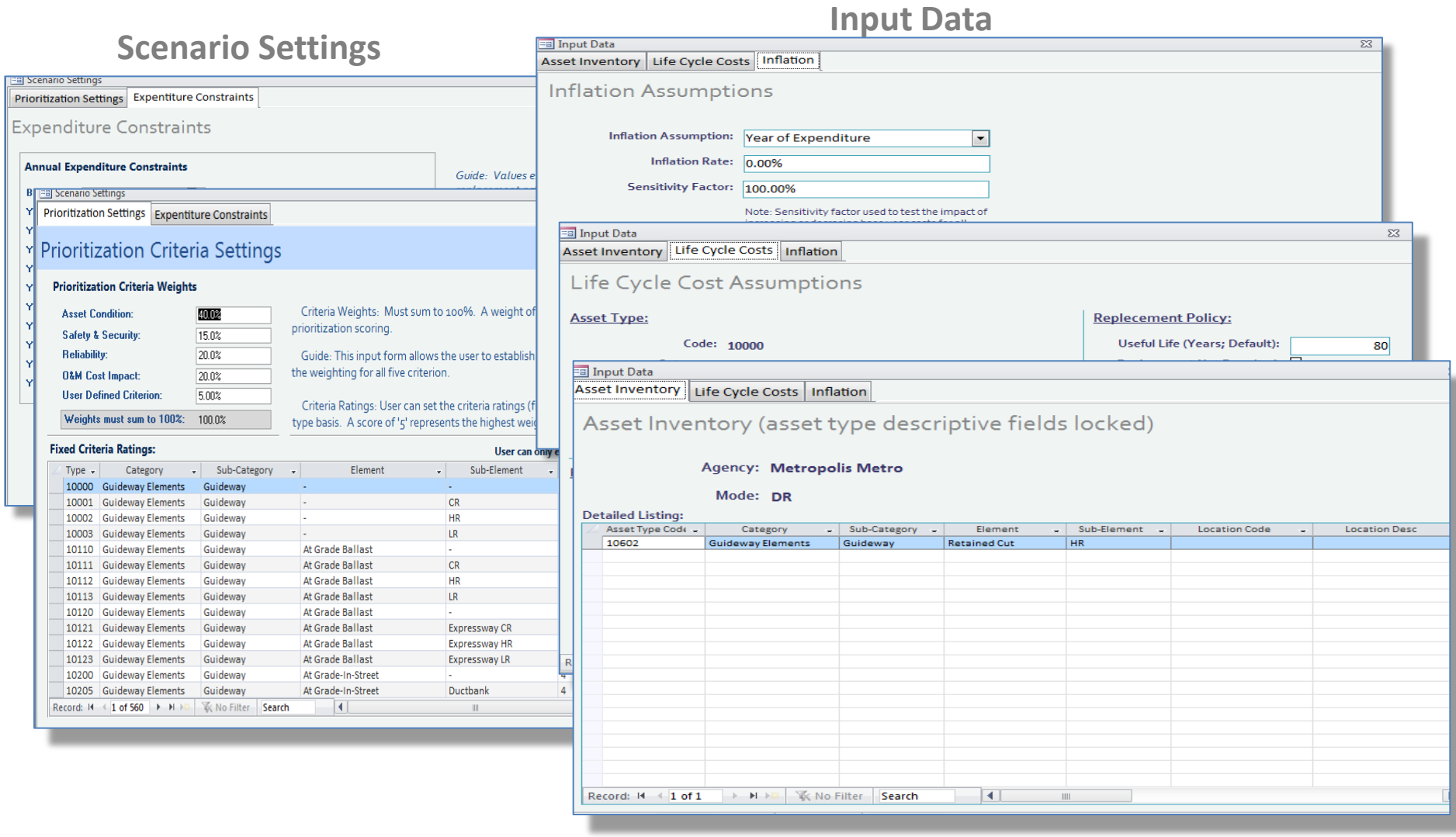
Output Exportable to Excel

Tool Parameters

What do I control?

- ✓ Annual expenditure levels
- ✓ Timing and cost of asset:
  - Replacement
  - Rehabs (up to 5 per type)
  - Annual capital maintenance
  - Soft costs
- ✓ Annual inflation assumptions
- ✓ Prioritization criteria (up to 5) and weights
- ✓ Output (export to Excel)

TERM Lite User Interface



TERM Lite Reports

Over Age Asset Forecast: 2010 - 2030

20-Jul-11

Summary Report

By Asset Category

	Percent of Assets Exceedung Useful Life										
Asset Category	2010	2012	2014	2016	2018	2020	2022	2024	2026	2028	2030
Replaceable Assets											
10000 Guideway Elements	30.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20000 Facilities	48.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30000 Systems	15.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

SGR Backlog Forecast: 2010 - 2030

20-Jul-11

Summary Report

By Asset Category

	Annual Expenditures ($M)																				
Mode / Asset Category	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Heavy Rail																					
Facilities	$230.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Guideway Elements	$1,640.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Stations	$2,756.7	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Systems	$1,067.6	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Vehicles	$2,185.8	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total: Heavy Rail	**$7,880.9**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
Motor Bus																					
Facilities	$863.3	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Systems	$36.5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Vehicles	$276.4	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total: Motor Bus	**$1,176.2**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
Systemwide Assets																					

TERM Lite Can Export Reports to Excel

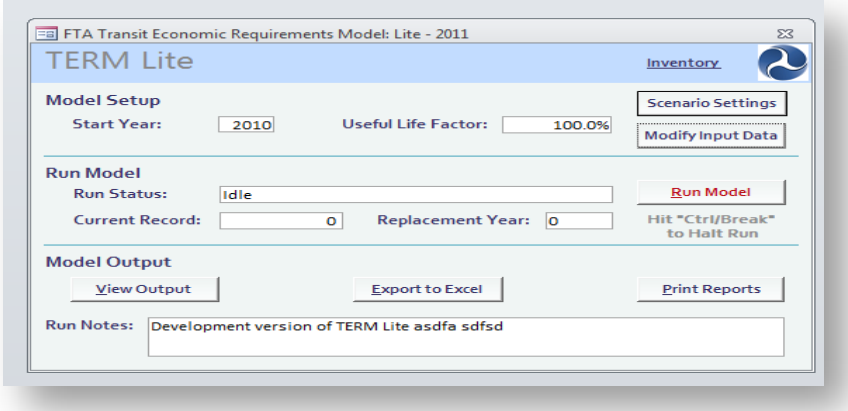
Excel Export Function

- Exports model output to Excel
  - ✓ Predefined, "presentation ready" charts and tables
  - ✓ "Raw output data" for user defined post-processing
  - ✓ Users more familiar with Excel features and capabilities

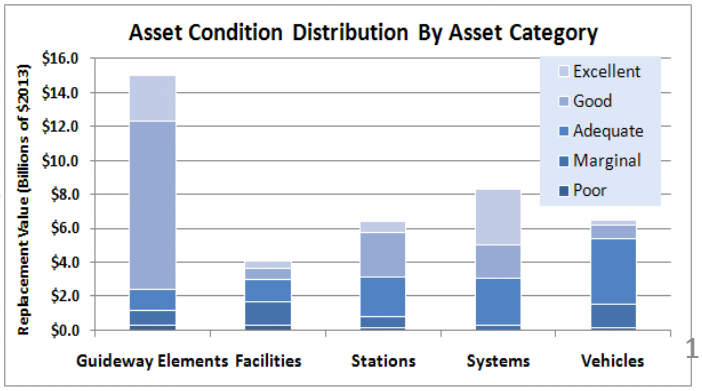
Sample Analysis

- The following slides illustrate TERM Lite funding impact analyses
  - ✓ Examines four funding levels
    - Financially unconstrained
    - 10 Years to SGR
    - Maintain backlog
    - Current spending
  - ✓ Operator data

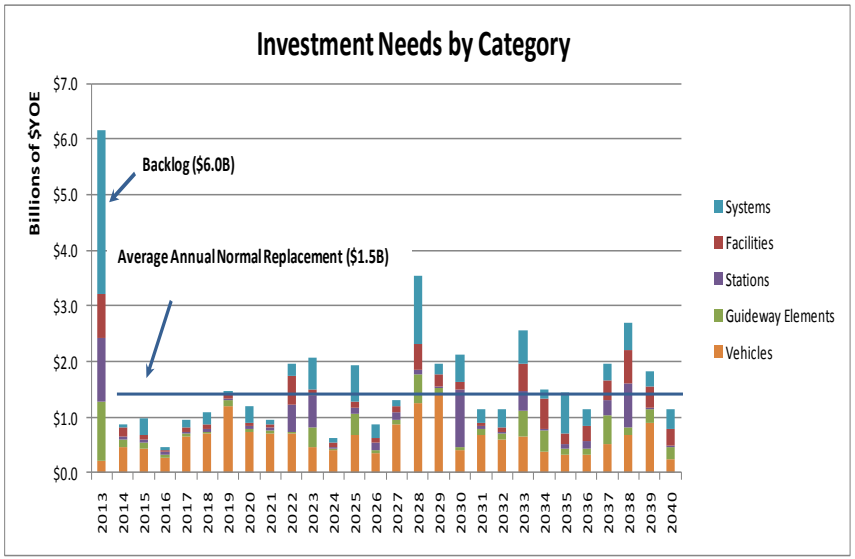
TERM-Lite: Microsoft Access

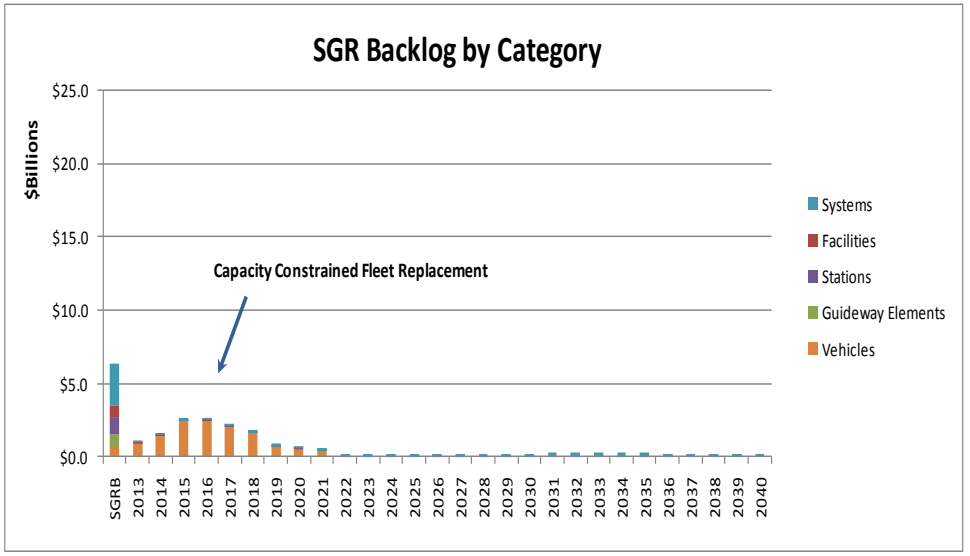


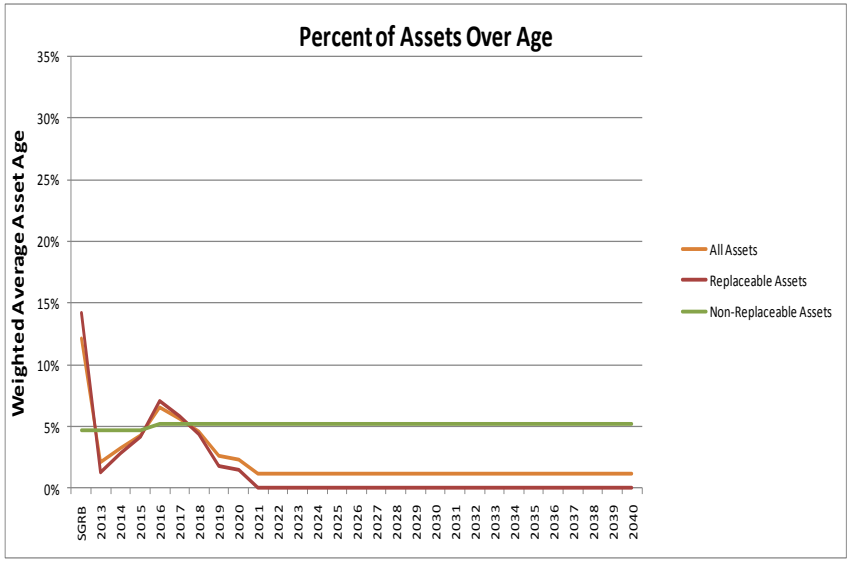
Excel Export Example

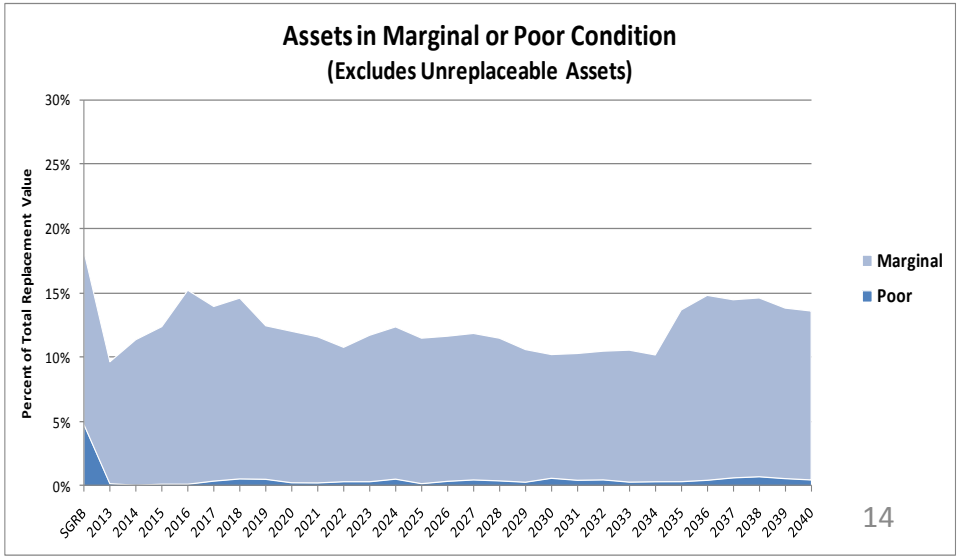


Sample Output: Financially Unconstrained ($1.7B Avg.)

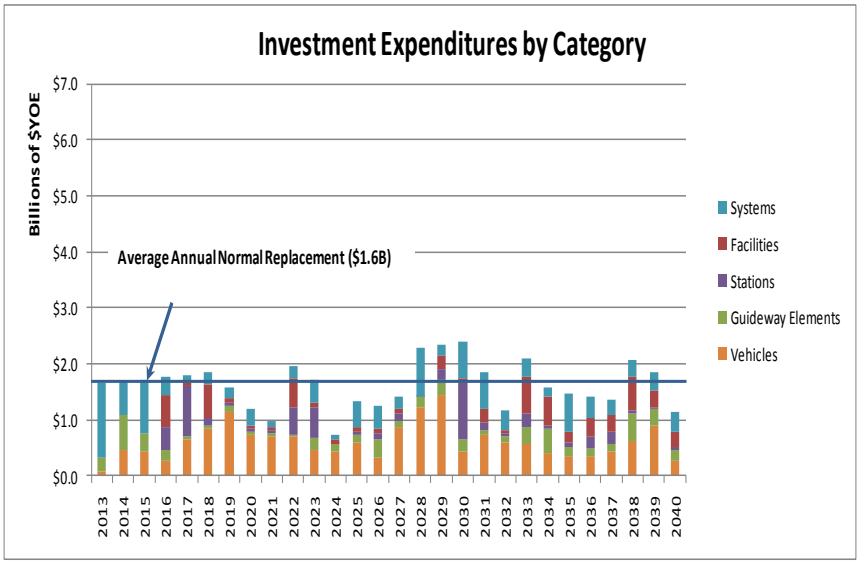


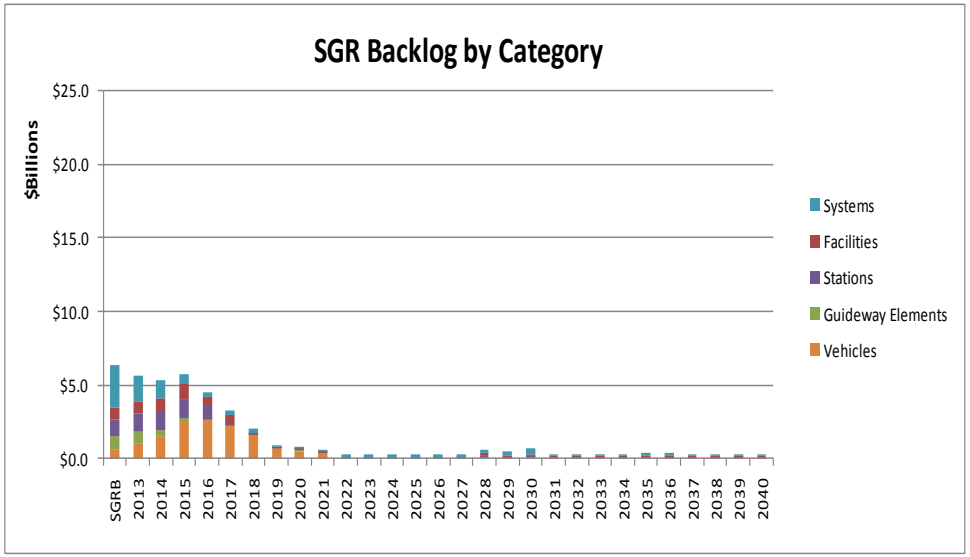


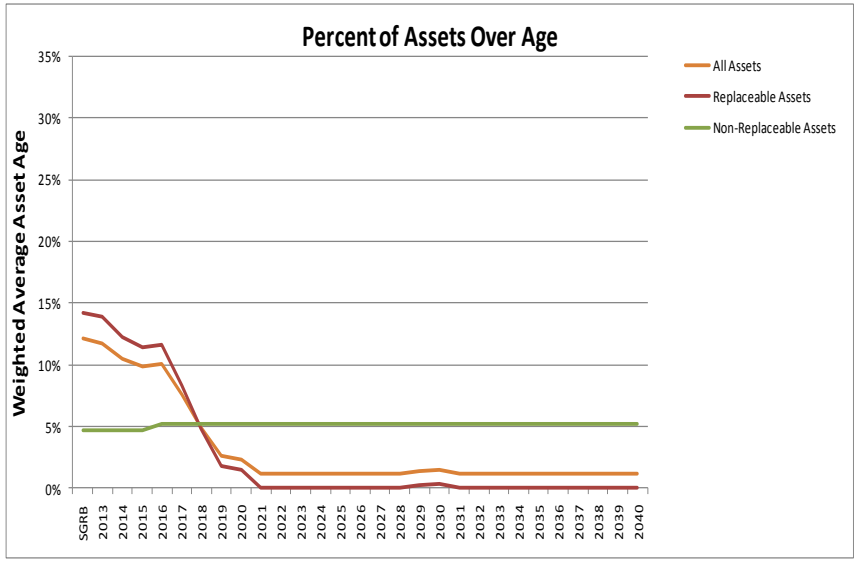


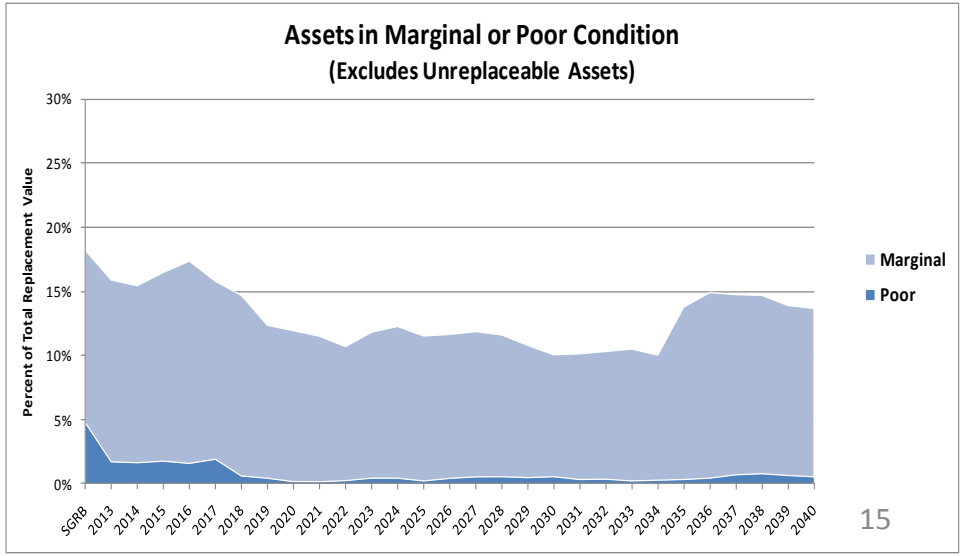


Sample Output: 10 Years to SGR ($1.6B Avg.)

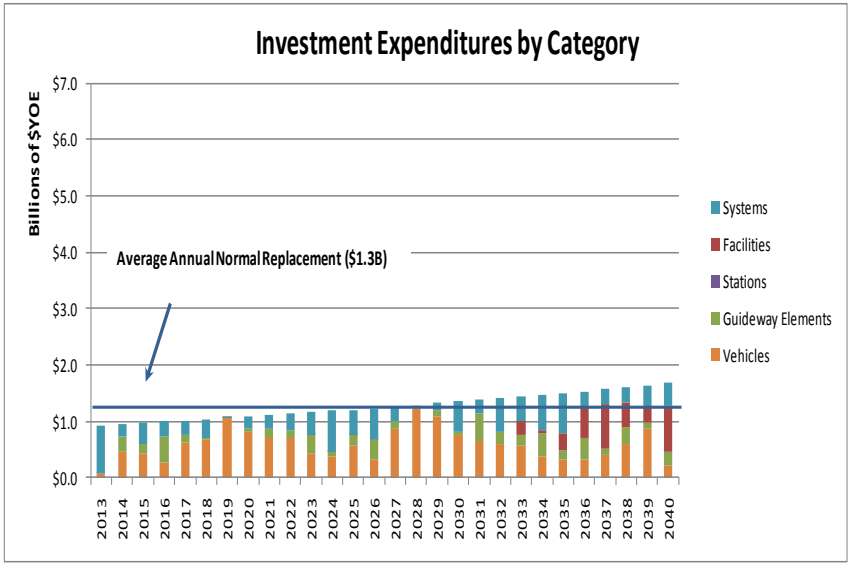


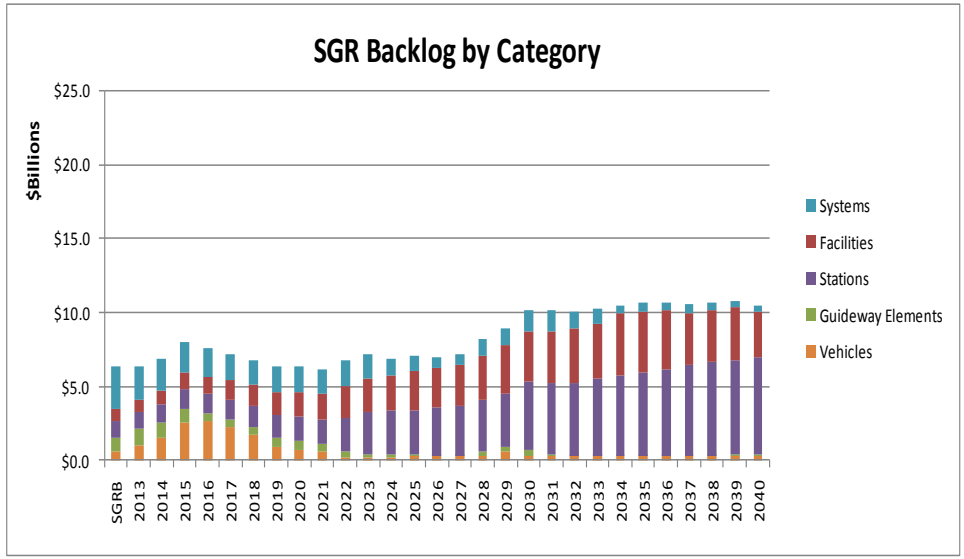


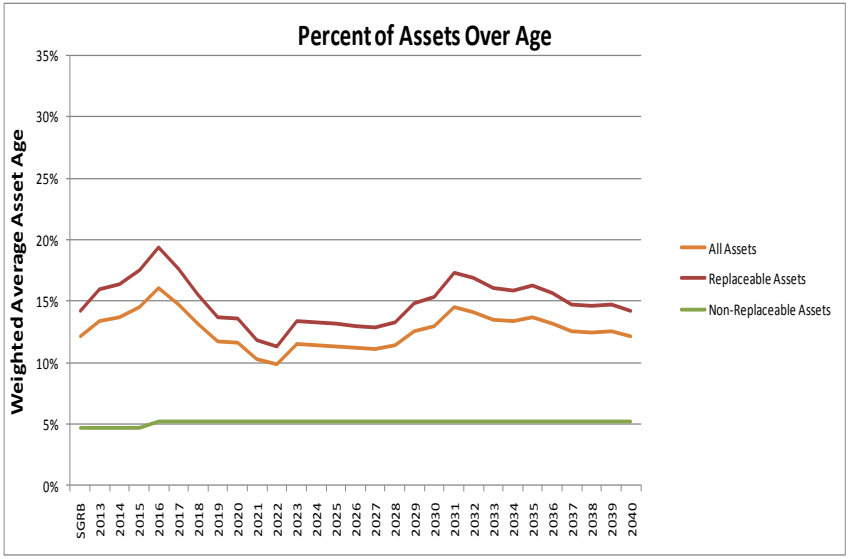


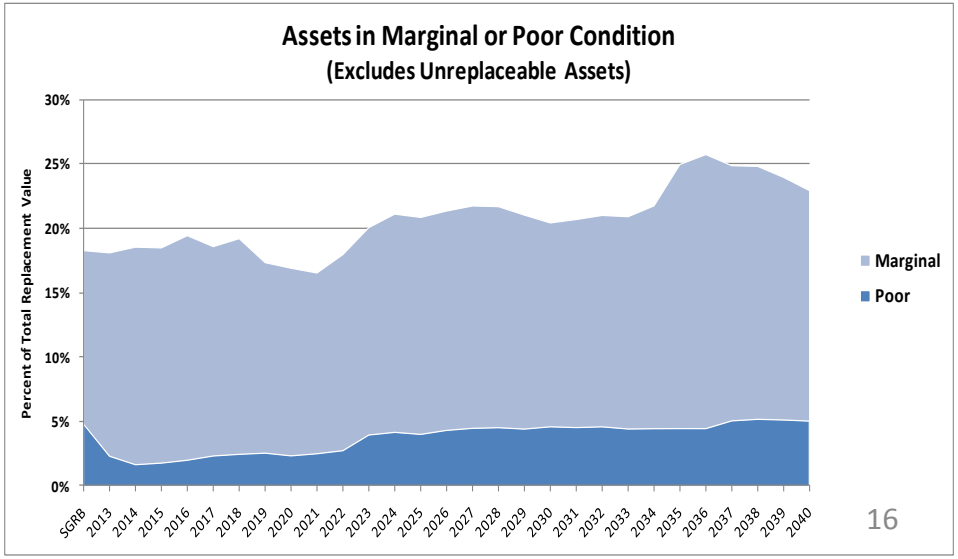


Sample Output: Maintain Backlog* ($1.3B Avg.)

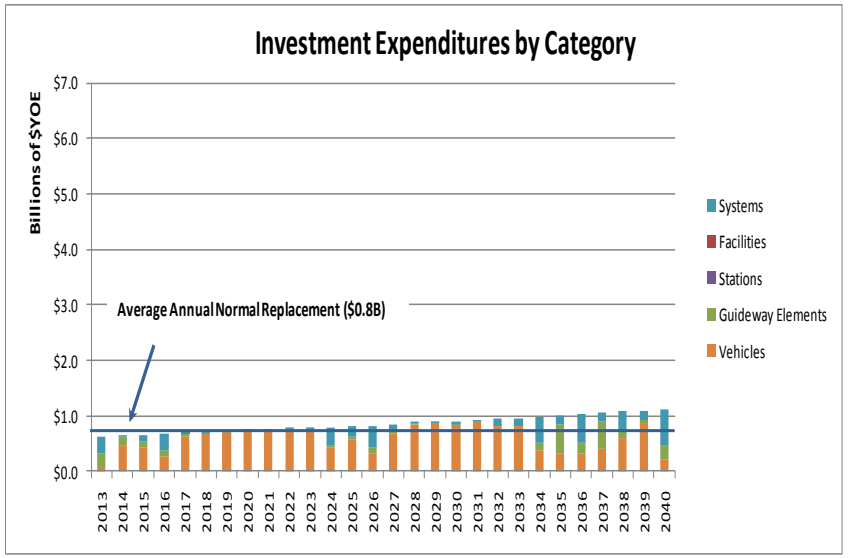


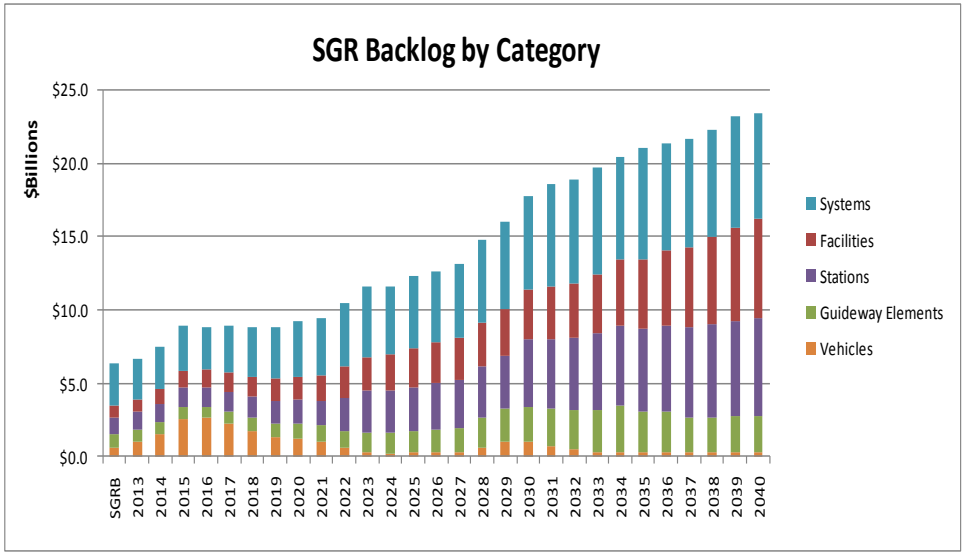


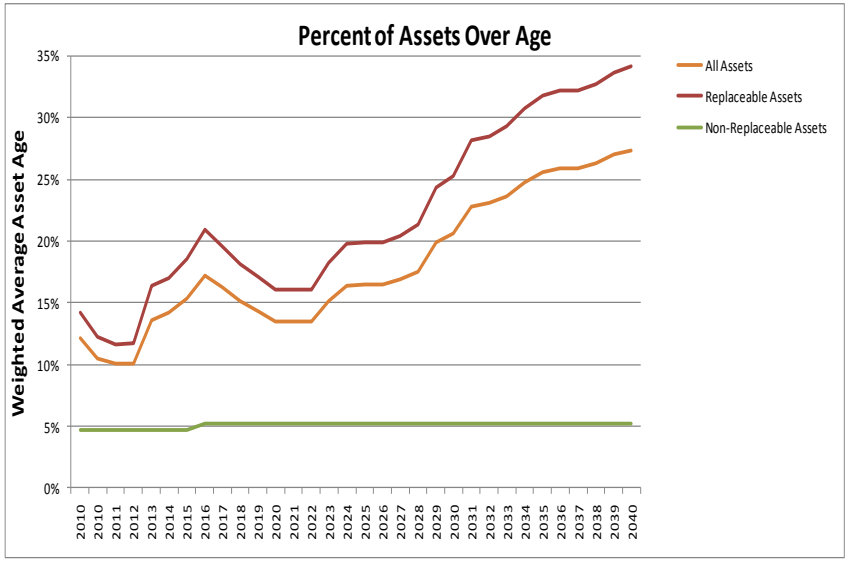


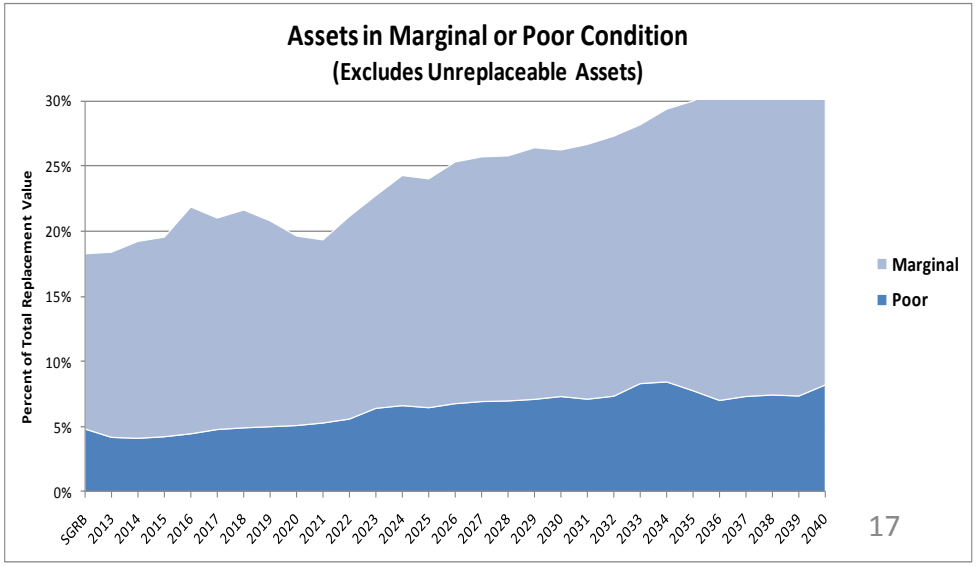


Sample Output: Historic Spending* ($0.8B Avg.)

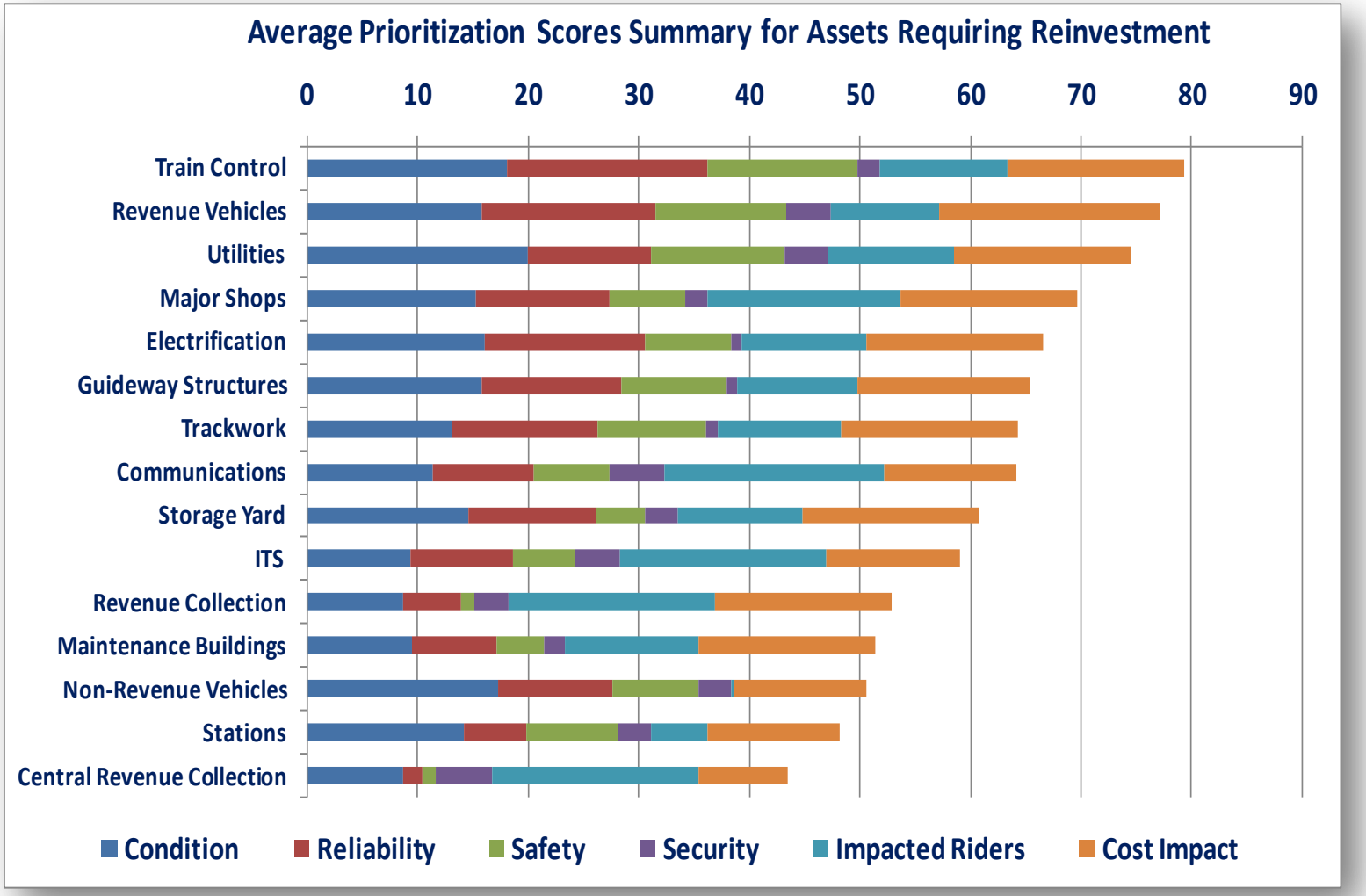








Sample: Prioritization Scoring Summary



TERM Lite: Suggested Scenarios

Scenario	Purpose / Value	How to Define
Maintain Current Spending	• What is the impact on the SGR backlog and prioritization of continuing to reinvest at the current (historical) rate?	• Enter $0 for year 0 • For years 1 to 20 enter avg. level of Service Board reinvestment for past 5 to 10 years • Can adjust for inflation
Maintain Backlog	• What level of investment will maintain the current size of the backlog (either in dollar terms or as a percent of all asset holdings)?	• User must enter test values for years 1 to 20 (enter same value for each year) and run the model multiple times until value of backlog in year 20 = value in year 0.
SGR in 20 Years	• What level of annual reinvestment is required to eliminate the SGR backlog in 20 years?	• User must enter test values for years 1 to 20 (e.g., enter same value for each year) and run the model multiple times until value of SGR backlog = $0 in year 20.
Un-constrained	• What would avg. annual reinvestment be if there was no backlog? • Investment must be higher than this to reduce the backlog	• Enter a very high level of investment (e.g., $500B) for years 0 (backlog year) through year 20
"Planned" or "Budgeted"	• Enter year by year funding amounts that are both (1) financially sustainable and (2) correspond with timing of known major reinvestment needs • Output will show impact of plan on future SGR backlog and help prioritize needs	

TERM Lite: How to Define a Scenario

Scenario Control (Location)	Description & Use	Example Uses
Frequently Used Scenario Controls		
Expenditure Constraints (Scenario Settings Form)	• User controls level of expenditures for projection years 0 through 20 • Used to assess impact of varying rates of reinvestment on conditions, prioritization and the SGR backlog	• Sample scenarios include: – Unconstrained needs – Maintain current spending – Level of funding to attain SGR
Prioritization Settings (Scenario Settings Form)	• *While typically held fixed*, user can change investment scoring to assess impact on priority rankings, composition of reinvestment activities, and SGR backlog	• User can alter: – Criteria weights (simple adjustment) – Fixed criteria scoring (detailed change)
Inflation (Input Data Form)	• Sets assumed rate of inflation for analysis period from year 0 to 20 – same rate applied across all years • "Sensitivity" factor allows user to simultaneously adjust all projection costs up or down by the same set amount (default value is 100%)	• User can select: – Current year dollars – in Start Year dollars as input on Main Menu – Year of Expenditure – based on user entered rate

TERM Lite: How to Define a Scenario (continued)

Scenario Control (Location)	Description & Use	Example Uses
Less Frequently Used Scenario Controls (these controls used more to define investment policies)		
Asset Useful Life (Asset Inventory Update Tab: Input Data Form)	• User can alter the useful life values of individual assets • Extending asset useful lives will lower long-term needs as assets require less frequent replacement	• e.g., change the useful life of "twelve year) buses to 14 years
Override (Asset Inventory Update Tab: Input Data Form)	• Clicking the override box for any asset will automatically assign an effective age of 1.5 times the asset's expected useful life (regardless of actual age) • Control used to accelerate replacement of problem assets	• Use of this feature does not ensure a highest possible prioritization score • Rather, ensures a high age based score for that specific asset's type and location (i.e., assets of other types and locations may still score higher)
Life Cycle Costs (Input Data Form)	• User can alter number, timing and cost of rehabs • Also controls cost of annual capital maintenance	• User can assess impact on needs of increasing/reducing number and/or cost of rehabs (note: will not impact condition measures)
Useful Life Factor (Main Menu)	• When set to values other than 100%, assets will be kept in service longer or shorter than their expected useful lives • This single factor allies to all assets	• Note: Useful life values are not altered (hence, if factor is set to 110%, assets will be kept in service until 110% of their expected useful life but will be overage one they exceed 100% of useful life)

Tool Reports

Report	Type	Content
Asset Inventory Record Ages	• Input Data	• Analysis of the age of the tools' asset records
Asset Inventory Replacement Value	• Inventory	• Total replacement value of all • Grouped by mode and asset category
Asset Types	• Input Data	• Asset types recognized by the database • Data tab provides detail on asset life-cycle cost assumptions
Average Annual Expenditures Forecast	• Needs forecast	• Average annual level of dollar investment needs over 20-years of model run (based on scenario inputs)
Condition Distribution Forecast	• Condition	• Forecast of percent of assets in excellent, good, fair, marginal and poor condition
Expenditures Forecast	• Needs forecast	• Forecast of prioritized annual investment needs (based on scenario inputs)

Tool Reports (continued)

Report	Type	Content
Over Age Asset Forecast	• Condition	• Forecast of percent of assets that exceed their useful life (based on scenario inputs)
Priority Scores: Backlog Investments by Asset Record (Detail)	• Prioritization scores	• Record level prioritization scores for investments to reduce current backlog (year 0)
Priority Scores: Backlog Investments by Asset Type by Location	• Prioritization scores	• Prioritization scores for investments to reduce current backlog (year 0) grouped by asset type and location
Priority Scores: Backlog Investment by Asset Type (Base 100)	• Prioritization scores	• Prioritization scores for investments to reduce current backlog (year 0) grouped only by asset type
Priority Scores: Summary Scores By Asset Type for Next 10 Years	• Prioritization scores	• Prioritization scores grouped only by asset type for projection years 0 to 20
SGR Backlog Forecast	• Backlog	• Projection of SGR backlog for years 0 through 20 (based on scenario inputs)